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ABSTRACT

This study investigated the effects of several variables on time-to-degree using a structural equation modeling approach. It examined influences upon time-to-degree for all students earning Bachelor's Degrees in 1998-99 at one university. Dependent variables were total elapsed semesters to degree attainment and total semesters enrolled. Data on students' time-to-degree, demographic and precollege educational characteristics, remedial course and summer freshman program participation, enrollment behaviors, and academic outcomes were assembled into a series of files and merged with student financial aid data and data from two surveys of students' pre-enrollment perceptions and graduates' undergraduate experiences. Average credit hours per term strongly predicted more rapid degree completion. Transfer credit hours was the only strong predictor of credit hour load per term. Total credit hours earned strongly predicted time-to-degree. A positive relationship existed between number of summer semesters enrolled and longer time to degree. The paper discusses: implications for academic advising concerning student course loads; mixed implications for the role of financial aid speculation over the negligible role of student experience and perception variables on time-to-degree; and recognition that timely degree completion is only one of several desirable student outcomes. (Contains 19 references.) (SM)

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Towards A Comprehensive Predictive Model of Time to Bachelor's Degree Attainment

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Abstract

Towards A Comprehensive Predictive Model
of Time to Bachelor's Degree Attainment

Accountability pressures, concern over efficient use of institutional resources, and consumer price sensitivity all point to the need for decreasing students' time to Bachelor's Degree attainment. Past studies have sought to describe time-to-degree and its influences, but have often used a narrow set of potential predictor variables and limited methods. The current study investigates the effects of a complex suite of variables (student background characteristics, remedial course and summer freshman program participation, enrollment behaviors, student experiences and perceptions, financial aid data, and academic outcomes) on time-to-degree using a structural equation modeling approach. Average student credit hour load per term, summer term enrollment, transfer credit hours, and number of failed courses were among the strongest predictors of total terms enrolled and total terms elapsed prior to graduation. Implications for academic advising concerning student course loads, the mixed implications for the role of financial aid, speculation over the negligible role of student experience and perception variables on time-to-degree, and recognition that timely degree completion is only one of several (sometimes conflicting) desirable student outcomes are discussed.

Towards A Comprehensive Predictive Model of Time to Bachelor's Degree Attainment

Concerns over the seemingly ever-rapidly increasing cost of undergraduate education, even within the public sector, on the part of students, parents, governmental agencies, and the media, accompanied with institutional sensitivity about efficient student use of scarce resources point to the need for decreasing undergraduates' time to Bachelor's Degree attainment (Adelman, 1999; Astin, Tsui, & Avalos, 1996; Volkwein & Lorang, 1996). A readily apparent example of federal government concern with this problem is the existence of the IPEDS Graduation Rate Survey. Several states such as Florida, Louisiana, Ohio, and South Carolina, have linked graduation rates to performance funding initiatives. A recent development in Ohio is the availability to state universities of Success Challenge funds, which rewards them for the timely degree completion of undergraduates.

A number of sources, relying upon national data, have concluded that five years of elapsed time to Bachelor's Degree completion, rather than the traditionally recognized four, has become the de facto average. The National Center for Educational Statistics High School and Beyond longitudinal study indicated 57 months as mean time-to-degree (Adelman, 1999). Numerous anecdotal reasons are offered for increased time-to-degree: more students are attending part-time, more are transferring between institutions, more are employed while attending college, a greater percentage need remedial course work, etc. Educational authorities and state legislatures have also begun to question whether lengthened time-to-degree is the fault of malingering students or of the institutions themselves through practices such as poor advising, insufficient class availability, and a proliferation of degree requirements. Higher education governing boards including those of Oregon (cited in Volkwein & Lorang, 1996) and Texas (Texas Higher Education Coordinating Board, 1996) have proposed policies to address increased time-to-degree, notably in the absence (at least initially) of reliable research.

While a plethora of research exists concerning college student first to second year retention, far fewer studies have been published concerning effects upon time-to-degree. Adelman (1999) found that students who exhibited no "stop out" behavior, did not transfer between institutions, had higher freshman grade point averages, were enrolled for a larger number of classes per term, withdrew from fewer courses or took fewer grades of "incomplete," and who were female graduated more quickly. The California State Postsecondary Education Commission (1988) related time-to-degree to students' financial need,

employment, and class loads. Duby and Schartman (1997) concluded that students who initially were enrolled for more classes per term graduated more quickly. The major finding of Hall's (1999) study was that "extender" students (those for whom time-to-degree was increased) took fewer classes per term. Knight (1994) noted that students with higher cumulative grade point averages at graduation, fewer total credit hours earned, fewer courses dropped, and higher SAT scores graduated more quickly. Lam (1999) studied both total terms enrolled and total terms elapsed (including "stop out") for graduates; he found full-time enrollment, higher grade point average at graduation, being an out-of-state student, being female, changing majors fewer times, percent of loan dollars in relation to students' total financial aid package, not being employed, and being a student of color to be predictive of more rapid degree completion. Noxel and Katunich (1998) spotlighted the role of greater student institutional commitment as facilitating more rapid degree completion. The Oklahoma State Regents for Higher Education (1996) associated transfer, class load per term, and major-changing behavior with time-to-degree.

While shedding important light on the issue, most of these studies have examined a narrow set of time-to-degree predictor variables and most have done so in a simple descriptive fashion or by using multiple regression. A more comprehensive approach might yield a more robust set of results. A study concerning primarily traditionally-aged, full-time, non-transfer students at a residential university (where one might surmise students' chance of timely degree completion is greatest) might also prove particularly interesting. One notable study which used multiple data sources (including student self-reported reasons for extending their time-to-degree) and multiple methods to study this issue was that of Volkwein and Lorang (1996). That study found that lower class loads per term, receiving financial aid in the form of grants, and higher grade point averages were associated with longer time-to-degree. Additionally, the study revealed that students extended their time-to-degree to give them more free time and to protect their grades. The Volkwein and Lorang (1996) study was limited, however, to full-time students at one research university whose time-to-degree on average was relatively brief. Measures of entering student academic ability, data on major-changing behavior, and data from students who were admitted under special programs were also lacking from that study.

The purpose of the current study is to attempt to overcome many of the limitations of the previous works cited and to extend this line of inquiry by studying the effects of a complex suite of variables

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(student background characteristics, remedial course and summer freshman program participation, pre-enrollment perceptions, enrollment behaviors, student experiences and perceptions, financial aid data, and academic outcomes) on undergraduate time-to-degree (both total terms enrolled and total terms elapsed) using a structural equation modeling approach which arrays and compares direct and indirect effects and highlights the role of mediating variables.

Method

Qualitative Phase of the Study

In an initial exploratory phase of the study, an e-mail message was sent to a random sample of 500 (approximately one-third of the) May 1999 baccalaureate graduates of the institution in the study, asking the following question: "If it has taken you longer than expected to graduate, why do you think this is the case and what can [the university] do to ensure that students graduate in a timely manner?" This activity was carried out as an attempt to expand the list of possible predictor variables of time-to-degree which would be used in the analytical phase of the study. One hundred eighteen replies were received, with most respondents noting that since they were graduating in four years, they had no reasons to offer for extended time-to-degree. Poor academic advising was cited most frequently as a reason for extended time-to-degree by the students offering reasons.

Characteristics of the Institution and the Population

The study examined influences upon time-to-degree for the entire population of students earning Bachelor's Degrees in 1998-1999 at a doctoral I public midwestern university with an enrollment of 19,000+ students. Students in the study were largely enrolled full-time, age 22-25 at graduation, and matriculated immediately following graduation from high school. Fifty-nine percent of the population was female, two percent were students of color, and 94% were state residents. Average high school grade point average for the population was 3.01 and average ACT composite score was 22.1. Two percent of the population participated in the Summer Freshman Program, which provides special services to new students who would otherwise be inadmissible due to their academic credentials. Twelve percent were enrolled in the university's remedial reading course, 10% in remedial English, and 9% in remedial mathematics. Slightly less than 1% of the students took advantage of the university's Academic Forgiveness Program, which permits students returning to the institution after a period of at least five years away to have their

grade point averages calculated from the point of readmission without losing credit for previous coursework with a grade of "C" or better.

For purposes of this study, students' major areas of study were grouped into areas corresponding either to colleges within the university or divisions within the college of arts and sciences. Approximately 14% of the students graduated in business administration, 28% in education and human development, 13% in health and human services, 4% in technology, 8% in mathematics and sciences, 9% in social sciences, 3% in humanities, 6% in arts, and 10% in communications. A final 5% of the students had majors in liberal studies or individually-planned programs; their majors were not included in the study. Sixty-nine percent of the students graduated in programs whose curricula were subject to the influence of accreditation standards. Ten percent graduated with double majors and 33% graduated with one or more minors. Nineteen percent of the students enrolled in at least one cooperative education course and 8% completed two or more.

Seventy-five percent of the students were enrolled for at least one summer semester; 42% were enrolled in two or more, and 16% were enrolled in three or more summer terms. Seventy-three percent changed their major at least once; 27% changed twice or more, and 8% graduated three or more times. Thirty-nine percent of the population retook at least one course; 21% withdrew from at least one course, and 37% failed at least one course. One percent of the students participated in the university's honors program. Students on average earned 39 credit hours in general education courses and earned a mean grade point average within general education of 2.89 on a 4.00 scale. The average credit hours students completed per semester was 14.0. Students graduated with a mean cumulative grade point average of 3.07 and with an average of 136.8 credit hours total; 18% graduated with honors.

Median semesters of enrollment to degree (including summers) for the population was 10. Median semesters elapsed (including "stop out" semesters) from matriculation to graduation was 14. This corresponds to approximately five years of enrollment.

Transfer students (N=264) were excluded from the population; 2,585 remaining students constituted the population for the remainder of the analyses. These students were excluded since significant differences between transfer and "native' students were found in both total semesters enrolled and semesters elapsed to degree (7.8 semesters enrolled for transfer students vs. 10.3 semesters for native

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students and 9.9 semesters elapsed for transfer students vs. 13.9 semesters for native students) and also to allow greater comparability to most previously published studies.

Methods

The underlying theoretical framework for the study was the college-student impact model typified by Astin (1970), Pascarella (1985), Tinto (1975, 1987), and Weidman (1989). Total elapsed semesters to degree attainment and total semesters enrolled served as dependant or "downstream" variables in two separate analyses. The influence of categories of predictor variables (student background characteristics, remedial course and summer freshman program participation, pre-enrollment perceptions, enrollment behaviors, student experiences and perceptions, financial aid data, and academic outcomes), both upon one another and upon the dependant variables, were tested using the SPSS AMOS structural equation modeling program within the framework of a structural model which was developed through a combination of theoretical and empirical approaches. The influence of each vertical column of variables shown in Figures 1 and 2 upon columns of variables to their right in the research model and also directly upon the dependant variables was tested using critical ratios to determine the significance of regression parameters. Covariances among error terms were also tested using modification indices and critical ratios. The overall goodness-of-fit for the two research models was estimated using several AMOS-supplied indices, including the Bentler-Bonett normed fit index, Bollen's relative fit index, Bollen's incremental fit index, the Tucker-Lewis index, and Bentler's comparative fit index (Arbuckle & Wothke, 1999).

Data on students' time-to-degree, demographic and pre-college educational characteristics, remedial course and summer freshman program participation, enrollment behavior variables, and academic outcomes were assembled into a series of data files by the university's Office of Registration and Records. These were merged with student financial aid data and data resulting from two questionnaires administered by the university's Office of Institutional Research: a first year student questionnaire which collects data upon students' pre-enrollment perceptions and an undergraduate experiences questionnaire which collects data upon college experiences and perceptions. A detailed listing of significant and non-significant predictor variables is provided in Tables 1 and 2, respectively.

Results

Goodness-of-fit indices for final research models 1 and 2 are shown in Table 3. All have a value of at least 0.9, which is noted by Bentler and Bonett (1980) as indicative of a good fit between the model and the data. Tables 4 and 5 show the results for effects upon semesters enrolled to degree completion and semesters elapsed, respectively. Standardized direct, indirect, and total effects are shown, rank ordered by total effect size. All direct effects show are statistically significant at the $\rho < .05$ level.

The first research model explained 81% of the variance in semesters enrolled to degree completion. The strongest predictors were mostly among those classified as academic outcomes and enrollment behavior variables: average credit hour load per semester, total credit hours at graduation, number of summer semesters enrolled, transfer credit hours, number of failed, cooperative education, withdrawn, and repeated courses, and participation in the Academic Forgiveness Program.

The second research model explained 43% of the variance in total semesters elapsed to degree completion. The strongest predictors were participation in the Academic Forgiveness Program, average credit hour load per semester, number of failed courses, total credit hours at graduation, high school grade point average, dependant financial aid status, and transfer credit hours.

It is also important to note the non-significant effects upon time-to-degree. These included (as listed in Table 2) dollar volume of student financial need unmet through institutional aid, graduation with honors, the ratio of student credit hours earned at graduation to the minimum hours required in the student's degree program, almost all of the college experience and perceptions variables taken from the undergraduate experiences questionnaire, and all of the pre-college perceptions variables taken from the first year student questionnaire.

Discussion

The finding that average credit hour load per term is a strong predictor of more rapid degree completion confirms that of nearly all of the previous studies cited, but its salience is particularly highlighted in the current study given its large number of predictor variables. The additional finding that transfer credit hours (gained through AP, CLEP, and/or simultaneous high school and college enrollment, and/or through taking courses at other institutions, typically in the summer at an institution near to students'

permanent residence), is the only strong predictor of credit hour load per term may suggest the existence of a strong motivational element among some students to graduate as quickly as possible.

Some findings hold few surprises: total credit hours earned is strongly predictive of time-to-degree, as is participation in the Academic Forgiveness Program (which is only open to students who have been away from their studies for at least five years); students with more transfer credit hours graduate more quickly; students who fail, withdraw from, and repeat more courses, and students with lower high school grade point averages, take longer to graduate. One unexpected finding, however, was the positive relationship between number of summer semesters enrolled and longer time-to-degree; while the expected finding might be that taking more summer courses decreases time-to-degree, the reverse was found to be true in the current study. It may be that students are using the summer terms to offset a lower credit hour load during the academic year, to make up for lost time due to changes of major or the need to take remedial classes, or to complete internships or cooperative education.

It is worthwhile to also relate the findings of the current study to those of the previous literature, although it must be remembered that the effect sizes for the variables discussed are small. As found by Volkwein and Lorang (1996) higher cumulative grade point average was associated with longer time-to-degree. Unlike that study, student financial aid in the form of grants related to decreased time-to-degree. Volkwein and Lorang (1996) noted lack of pre-college ability indicators, a reliable index of major-changing behavior, and inclusion of specially-admitted students as limitations in their study; the current work shows higher ACT scores and high school grade point averages to be supportive of decreased time-to-degree, while number of major changes and participating in the summer freshman program related to longer time to degree completion. Finally, as was the case in the Volkwein and Lorang study, student satisfaction with course availability was not a significant predictor of time-to-degree.

As in Lam's (1999) study, campus-based employment helped to increase time to degree and loan dollars received helped to decrease total semesters elapsed, but (unlike Lam's study) loans served to increase total semesters enrolled. Also as in Lam's (1999) research, grade point average at graduation and being female served to decrease time-to-degree, while being an in-state student and changing majors more frequently served to increase it; unlike Lam's results, students of color in the current study graduated more slowly. Adelman's (1999) findings that total credit hours earned, more courses dropped, and lower pre-

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college ability lengthened time-to-degree were validated here. Like Knight's (1994) study, students with fewer total credit hours earned, fewer courses dropped, and greater pre-college ability graduated more quickly; unlike that previous research, higher cumulative grade point averages at graduation were associated in the current work with increased time-to-degree.

Before proceeding with a discussion of the implications of these findings, mention of the limitations of the study are in order. Foremost among these is that fact that the current study was limited in scope to that of a single institution. While the above discussion has compared the results of the current study, carried out at a public, Doctoral I, residential, midwestern university, to those carried out in several different settings, a more systematic, multi-institutional approach to studying time-to-degree and its antecedents could be enlightening. One drawback to such a study, though, would be the complexity of assembling comprehensive and comparable data sets. Secondly, while students' satisfaction with course availability did not have a significant effect upon time-to-degree, no objective measure of the university's course availability was available for use in the study. Graduating students in the study represented "survivors;" it may be that those in their cohort who could not enroll in the necessary courses at the desired times were still enrolled or left the university. A third potential limitation of the current study lies in the fact that student financial aid data were only available spanning the last three years of enrollment for the population; it is possible that a more complete financial aid data set might have altered the results. Finally, reliable, systematic data on non-campus-based student employment (other than student self-estimated hours per week working) were not available.

The study has hopefully demonstrated the ability of an institutional research office to carry out a highly policy relevant analysis using data routinely collected on campus. The study also showcases the utility of a structural equation modeling approach for arraying and comparing direct and indirect effects. More generally, the study serves to illustrate the trend in studies on college students noted by Pascarella and Terenzini (1991) that what happens to students during the course of their enrollment in college has a stronger effect on important outcomes than do the demographic characteristics they bring with them.

The current research offers a number of implications for enrollment management, the first of which concerns the need to get students, in appropriate circumstances, to carry heavier credit hour loads as a mechanism to shorten time-to-degree. As Volkwein and Lorang (1996) note, many baccalaureate

programs require a student credit hour load of 16-17 or greater per semester for students to graduate in four years without enrolling in summer (this also excludes the need to take remedial or elective courses, change majors, etc.). Yet campus policies allow students to be considered as "full-time" for registration, fee payment, financial aid (federal and state policies come in to play here as well), and other purposes if they enroll with just 12 semester credit hours per term. Clearly, a lighter course load is in the best academic or personal interest of some students, but a systematic approach to academic advising that encourages students to take higher course loads when warranted would significantly decrease time to degree attainment for most students. Advising interventions may also help to decrease the number of failed, dropped, or repeated courses.

The study offers mixed implications concerning the role of student financial aid in promoting more rapid time-to-degree. Need-based grants help to decrease semesters enrolled to degree, while they are not a significant predictor of semesters elapsed to degree. Non-need-based grants are not a significant predictor of semesters enrolled to degree, but help to decrease semesters elapsed to degree. Scholarship dollars help to slightly increase semesters enrolled to degree, but to decrease semesters elapsed to degree. Need-based and non-need-based loans serve to slightly increase semesters enrolled to degree, but to decrease semesters elapsed. On-campus employment dollars have a very small positive affect upon semesters enrolled to degree, but are not a significant predictor of semesters elapsed. Students' unmet need (the dollar difference between average costs and a student's financial aid package) is not a significant predictor of either outcome; presumably students found some way to meet this need (perhaps through family, personal resources, bank loans, etc.) to enable them to enroll. While all of the aforementioned effects of financial aid variables had very small effect sizes, having a dependant financial aid status fairly strongly helped to decrease time-to-degree, both semesters enrolled and elapsed.

In parallel with Volkwein and Lorang's findings, most student-college experiences and perceptions, including satisfaction with course availability, were not significant predictors of time-to-degree. The exceptions to this were experiences with faculty and with writing and learning resources, weekends per month spent on campus, hours per week working, and the importance of graduating for semesters enrolled to degree; none of these variables were significant predictors of semesters elapsed to degree. As suggested by Pascarella and Terenzini (1991), academic and social integration may have a

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particularly salient effect upon first to second year retention, but that influence may dissipate over time and this have less influence upon degree attainment (and time-to-degree). Pascarella and Terenzini's findings about the importance of academic achievement and the varying effect of major field of study on degree attainment was extended to the outcome of time-to-degree by this work.

The fact that enrollment in cooperative education courses had a relatively strong positive effect upon time-to-degree illustrates the important caveat that timely degree completion is not all that matters in terms of college student outcomes. Both analytical and student self-report evidence supports the fact that enrollment in cooperative education courses, involvement in internships, participation in various "learning community" programs, etc., while perhaps extending time-to-degree, significantly improves student learning and skill development, affective outcomes, career prospects, and the like. Significantly improving time-to-degree could perhaps demand a trade-off against other long-term (and maybe more important) outcomes. As is often the case in higher education policy and practice, and as has been observed by many, the actions we take and the outcomes we hope to facilitate are ultimately a function of our mission and values.

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Table 1

Significant Predictor Variables in the Research Models

Variable	Description
Demographic and Pre-College Educational Variables	
ACT Composite Score	
High School Grade Point Average	
Gender	Dummy-Coded as Female = 1, Male = 0
State Resident	Dummy-Coded as State Resident = 1, Non-Resident = 0
Student of Color	Dummy-Coded as American Indian, Asian, Black, or Hispanic = 1, White = 0
Transfer Hours	Student Credit Hours Earned by Advanced Placement, College Level Examination Program, Dual High School and College Enrollment, or Transient Enrollment at Another Institution
Remedial Course and Summer Freshman Program Participation	
Remedial English	Dummy-Coded as Enrolled = 1, Not Enrolled = 0
Remedial Mathematics	Dummy-Coded as Enrolled = 1, Not Enrolled = 0
Remedial Reading	Dummy-Coded as Enrolled = 1, Not Enrolled = 0
Summer Freshman Program	Dummy-Coded as Enrolled = 1, Not Enrolled = 0
Enrollment Behaviors	
Academic Forgiveness Program Participation	Dummy-Coded as Yes = 1, No = 0
Cumulative Grade Point Average in General Education Classes	
Cumulative Grade Point Average at the End of the First Year	
Honors Program Participation	Dummy-Coded as Yes = 1, No = 0
Major: Arts	Dummy-Coded as Yes = 1, No = 0

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Major: Business	Dummy-Coded as Yes = 1, No = 0
Major: Communications	Dummy-Coded as Yes = 1, No = 0
Major: Education	Dummy-Coded as Yes = 1, No = 0
Major: Health and Human Services	Dummy-Coded as Yes = 1, No = 0
Major: Humanities	Dummy-Coded as Yes = 1, No = 0
Major: Math and Science	Dummy-Coded as Yes = 1, No = 0
Major: Social Sciences	Dummy-Coded as Yes = 1, No = 0
Major: Technology	Dummy-Coded as Yes = 1, No = 0
Number of Majors at Graduation	
Number of Minors at Graduation	
Number of Courses From Which the Student Withdrew	
Number of Courses the Student Failed	
Number of Courses the Student Repeated	
Number of Cooperative Education Courses Completed	
Number of Times the Student Changed Majors	
Total Credit Hours Earned in General Education Courses	
<u>College Experiences and Perceptions (From Undergraduate Experiences Questionnaire)</u>	
Faculty Experiences	10-Item Scale, $\alpha = .85$
Hours per Week Studying	5-Point Likert-Type Item
Hours per Week Working	5-Point Likert-Type Item
Importance of Graduating From College	4-Point Likert-Type Item
Number of Weekends per Month Spent on Campus	6-Point Likert-Type Item
Writing and Learning Resources Experiences	10-Item Scale, $\alpha = .85$
<u>Financial Aid Variables</u>	
Financial Aid Dependant Status	1 = Dependant, 0 = Independent, Average of 1996-97, 1997-98, 1998-99
Campus Employment Aid Dollars Disbursed	Average of 1996-97, 1997-98, 1998-99
Need-Based Grant Aid Dollars Disbursed	Average of 1996-97, 1997-98, 1998-99

Need-Based Loan Aid Dollars Disbursed	Average of 1996-97, 1997-98, 1998-99
Non-Need-Based Grant Aid Dollars Disbursed	Average of 1996-97, 1997-98, 1998-99
Non-Need-Based Loan Aid Dollars Disbursed	Average of 1996-97, 1997-98, 1998-99
Scholarship Aid Disbursed	Average of 1996-97, 1997-98, 1998-99
Academic Outcomes	
Average Student Credit Hours per Semester	
Cumulative Grade Point Average at Graduation	
Number of Summer Semesters Enrolled	
Total Credit Hours Earned at Graduation	

Table 2

Non-Significant Predictor Variables in the Research Models

Variable	Description
Pre-Enrolment Perceptions From First Year Student Questionnaire	
Anticipated College Activities (e.g., Change My Major, Graduate With Honors, etc.)	
Anticipated Need for Remedial Classes in Various Subjects	
Highest Degree Aspired to at Any University	
Highest Degree Aspired to at This University	
Parents' Annual Income	
Parents' Highest Education Levels	
Self-Described Abilities (e.g., Creativity, Leadership Ability, etc.)	
This University Represented My First Choice, Second Choice, etc.	
Years of High School Courses Completed in Various Subjects	
College Experiences and Perceptions From Undergraduate Experiences Questionnaire	
Career Gains	3-Item Scale, $\alpha = .83$
General Education Gains	4-Item Scale, $\alpha = .70$
Inquiry Gains	4-Item Scale, $\alpha = .84$
Interaction Gains	6-Item Scale, $\alpha = .84$
Satisfaction	19-Item Scale, $\alpha = .96$
Satisfaction with Class Availability	4-Point Likert-Type Item
Class Experiences	10-Item Scale, $\alpha = .81$
Conversations	16-Item Scale, $\alpha = .91$
Experiences with Other Students	10-Item Scale, $\alpha = .90$
Student Organizations	10-Item Scale, $\alpha = .89$
Institutional Cynicism	13-Item Scale, $\alpha = .77$

Perceived Institutional Emphasis	6-Item Scale, $\alpha = .88$
Perceived Relational Environment	4-Item Scale, $\alpha = .77$
Financial Aid Variables	
Unmet Need Dollars	Average of 1996-97, 1997-98, 1998-99
Academic Outcomes	
Graduation with Honors	Dummy-Coded as Yes = 1, No = 0
Ratio of Student Credit Hours Earned at Graduation to Minimum Hours Required for Degree	

Table 3

Goodness-of-Fit Results for the Research Models

Index	Semesters Enrolled Model	Semesters Elapsed Model
Bentler-Bonett Normed Fit Index	.942	.960
Bollen's Relative Fit Index	.915	.935
Bollen's Incremental Fit Index	.962	.977
Tucker-Lewis Index	.944	.963
Bentler's Comparative Fit Index	.961	.977

Table 4

Decomposition of Standardized Effects on Semesters Enrolled to Degree (R^2=.811)

Predictor Variables	Direct Effect	Indirect Effect	Total Effect	Rank
Average SCH/Semester	-.497		-.497	1
Total SCH at Graduation	.418		.418	2
Summer Semesters Enrolled	.300		.300	3
Transfer SCH	-.121	-.169	-.290	4
Number of Failed Classes	.094	.175	.269	5
Number of Cooperative Education Courses		.161	.161	6
Number of Withdrawn Courses	.078	.046	.124	7
Number of Repeated Courses		.116	.116	8
Academic Forgiveness Program	.069	.041	.110	9
Dependant Financial Aid Status	-.045	-.051	-.096	10
High School GPA	-.032	-.064	-.096	10
Summer Freshman Program		.095	.095	11
Gender (Female)	-.027	-.059	-.086	12
Major Area: Communications	-.068	-.013	-.081	13
State Resident	.022	.056	.078	14
ACT Composite Score		-.077	-.077	15
Major Area: Math and Science	-.034	-.043	-.077	15
Number of Majors		.076	.076	16
Major Area: Education	-.144	.220	.076	16
Major Area: Technology	-.027	.102	.075	17
Major Area: Social Sciences	-.067		-.067	18
Cumulative GPA at Graduation	.056		.056	19
Number of Major Changes		.055	.055	20

Major Area: Health & Human Services	-.039	.081	.042	21
Major Area: Business	-.038	-.004	-.042	21
GPA Freshman Year	-.090	.050	-.040	22
Major Area: Humanities	-.036		-.036	23
Ethnicity (Student of Color)		.033	.033	24
Remedial Math	.019	.014	.033	24
Major Accredited	.029	.003	.032	25
Faculty Experiences	-.032		-.032	25
Major Area: Arts	-.047	.074	.027	26
Writing and Learning Resources Experiences	.027		.027	26
Need-Based Loan $ Disbursed	.026		.026	27
Importance of Graduating from Any Institution	-.026		-.026	27
Number of Minors		.024	.024	28
Need-Based Grant $ Disbursed	-.022		-.022	29
Hours/Week Working		.018	.018	30
Weekends Spent on Campus		-.016	-.016	31
GPA in General Education Courses		.014	.014	32
Remedial English		.013	.013	33
Non-Need-Based Loan $ Disbursed		.013	.013	33
Honors Program		-.003	-.003	34
Scholarship $ Disbursed		.003	.003	34
On-Campus Employment $ Disbursed		.002	.002	35
SCH in General Education Courses		-.002	-.002	35

Table 5

Decomposition of Standardized Effects on Semesters Elapsed to Degree (R^2=.434)

Predictor Variables	Direct Effect	Indirect Effect	Total Effect	Rank
Academic Forgiveness Program	.324	.028	.352	1
Average SCH/Semester	-.344		-.344	2
Number of Failed Courses	.197	.072	.269	3
Total SCH at Graduation	.239		.239	4
High School GPA	-.133	-.085	-.218	5
Dependant Financial Aid Status	-.091	-.024	-.115	6
Transfer SCH		-.104	-.104	7
Major Area: Education		.077	.077	8
State Resident	.035	.041	.076	9
Number of Withdrawn Courses	.052	.018	.070	10
Major Area: Technology		.055	.055	11
Number of Majors		.045	.045	12
Summer Freshman Program		.042	.042	13
Non-Need-Based Grant $ Disbursed	-.040		-.040	14
Gender (Female)		-.036	-.036	15
Need-Based Loan $ Disbursed		-.032	-.032	16
Number of Major Changes		.032	.032	16
Major Area: Arts		.030	.030	17
Remedial Math		.030	.030	17
Number of Repeated Courses	-.095	.067	-.028	18
Major Area: Health & Human Services		.027	.027	19
ACT Composite Score		-.026	-.026	20
Major Area: Business		-.023	-.023	21

Major Accredited		.017	.017	22
Major Area: Math and Science		-.015	-.015	23
GPA Freshman Year		.013	.013	24
Scholarship $ Disbursed		-.014	-.014	25
Number of Minors		.012	.012	26
Major Area: Social Sciences		-.011	-.011	27
Remedial English		.009	.009	28
Number of Cooperative Education Courses	-.054	.047	-.008	29
Ethnicity (Student of Color)		.005	.005	30
Non-Need-Based Loan $ Disbursed		-.002	-.002	31

Figure Caption

Figure 1. Structural model of effects upon total semesters enrolled.

Note. Error terms have been omitted for clarity.

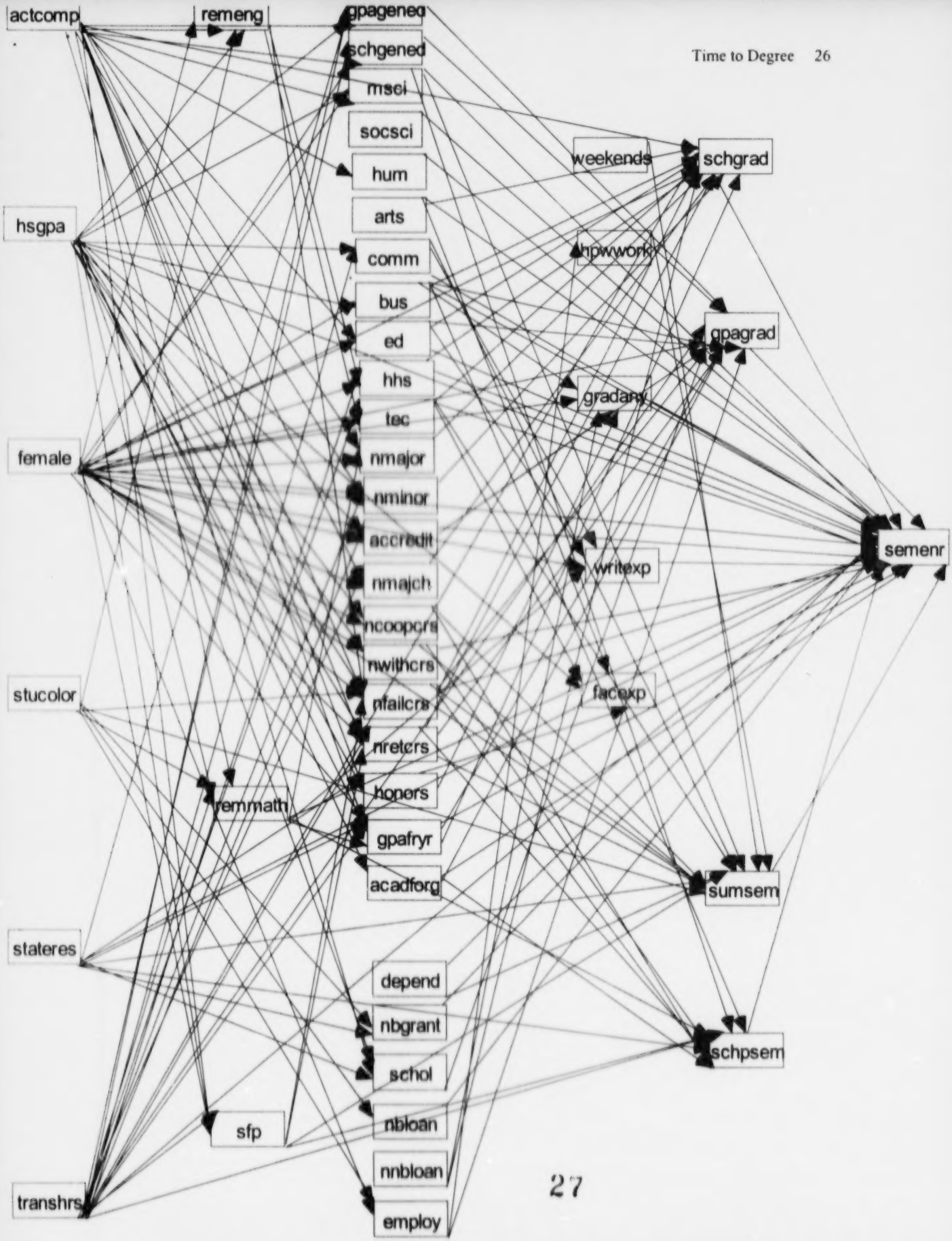
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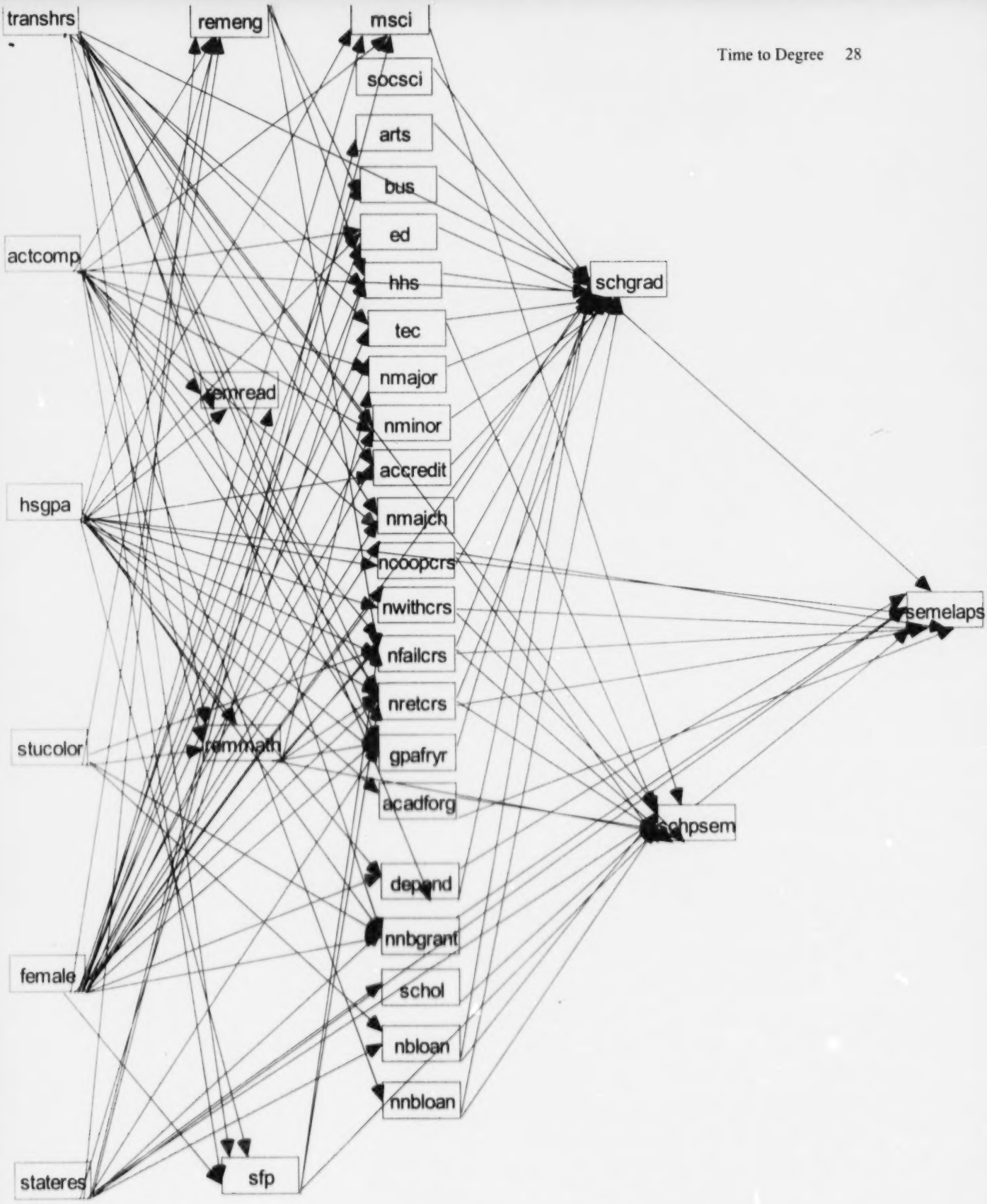
Figure Caption

Figure 2. Structural model of effects upon total semesters elapsed.

Note. Error terms have been omitted for clarity.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